MONITORING METHYL BROMIDE LEVELS AROUND AN ALMOND WAREHOUSE DURING FUMIGATION IN SACRAMENTO, CALIFORNIA, OCTOBER 1980

By

William G. Cusick, Environmental Hazards Specialist III
Robert A. Reeves, Sr. Industrial Hygienist
David Conrad, Agricultural Chemist III
Cynthia Au, Environmental Hazards Specialist
Rosemarie Christiansen, Agricultural Inspector I

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California Department of Food and Agriculture
Division of Pest Management, Environmental
Protection and Worker Safety
Worker Health and Safety Branch
1220 N Street, Sacramento, California 95814

SUMMARY

On October 23, 1980, the Sacramento County Agricultural Commissioner's Office notified the Worker Health and Safety Unit of a scheduled almond fumigation. This fumigation was of interest because of its enormous size (the use of 5,000 lbs. of methyl bromide) and the fact that there was a shortage of almonds at the processing plant, thereby requiring rapid movement of almonds to the plant after fumigation. The normal time between fumigation and processing is 15 days; in this instance, the time was to be less than 4 days, if possible.

On October 25, 1980, Worker Health and Safety Unit staff arrived at the California Almond Growers Association's North Sacramento bulk storage warehouse at the agreed time. Because of unstable weather conditions, the methyl bromide application had been initiated earlier, and had been completed. Upon arrival of staff, the doors and exterior of the plant were monitored. The amount of gas detected migrating through the walls and doors was well below the established TLV of 15 ppm as measured by a MIRAN-1A Unit by an instantaneous infra-red process, and by color-change indicator tubes.

On October 26, 24 hours following the start of the application, the venting process was monitored. Air sampling devices, including the MIRAN-1A and charcoal tubes attached to personal air pumps, were strategically placed around the facility. Venting was accomplished by use of many high volume blowers, making many changes of air to the outside. Throughout monitoring of the venting activity, the levels of methyl bromide did not exceed 5 ppm within the chain-link security fencing. Transport of the almonds was planned for the afternoon of October 27.

On October 27 at 3:30 p.m., initial monitoring conducted by the fumigator, and confirmed by monitoring equipment, indicated that the concentration of methyl bromide was in excess of 100 ppm inside the structure. There appeared to be a direct relationship between the amount of fumigant detected and the proximity to the almond piles, i.e., the nearer the almonds, the greater the methyl bromide concentration. Additional monitoring was conducted around the perimeter of the structure, and the findings there were well below 5 ppm. Based on these data, the decision was made to move the almonds on the following morning after considerably more ventilation with the high volume blowers.

On October 28 at 8 a.m., accompanied by the fumigator, Worker Health and Safety staff monitored the interior of the building and determined that the fumigant concentrations were in the 7-10 ppm range. Commodity transfer began, and monitoring of both the front-dump driver's breathing zone exposure and the methyl bromide concentrations inside the building continued to determine if the fumigant concentration would increase when the almond stacks were moved. Monitoring demonstrated that the driver's exposure was below 1 ppm methyl bromide, and the concentration inside the facility was in the 4-7 ppm range.

After the almonds arrived at the processing plant, monitoring of the workers' exposure to methyl bromide continued, and samples were analyzed for residue levels of the pesticides in the nutmeat and shells. No methyl bromide was detected in or about the processing plant, and the residue values reported were well below the established tolerance.

Confirmatory air samples were collected with Du Pont personal air pumps pulling air through charcoal sampling tubes. The methyl bromide trapped was analyzed by gas chromatography as reported below:

Date	Location	Amt of Methyl Bromide Detected (ppm)
10-26-80	Across street from facility	N.D.
	North side of facility	4.5
	East side of facility	N.D.
	West side of facility	1.0
10-27-80	West side of facility	5.0
	Middle of facility	4.1
	Interior wall of facility	5.2

Date	Location	Amt of Methyl Bromide Detected (ppm)
10-28-80	Forklift driver	0.8
	Middle of facility	6.4
	Middle of facility	6.9
	South side of facility	7.2
	Forklift driver	0.9

These air sample results compared well with simultaneous measurements which had been made by the MIRAN unit and with color-change indicator tubes.